Reconstructing the Landscape of Chesterville Plantation

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Introduction

The land which today makes up the NASA Langley Research Center was previously part of several large plantations. One of these plantations was Chesterville, birthplace and country home of George Wythe, signer of the Declaration of Independence and lifelong friend of Thomas Jefferson. Chesterville has been listed on the National Register of Historic Places since 1973, but our knowledge of the plantation landscape is extremely imperfect. Not only is the arrangement of outbuildings almost completely unknown, but the broader arrangement of fields, pasture, and historically wooded areas is also very little understood. This project represents an attempt to fill the gaps in this knowledge of the plantation landscape through GIS modeling, and to produce data on probable arrangements of former plantation features.

Background Information

On the modern landscape, the remains of two buildings associated with Chesterville are visible. One is a house foundation, mostly of stone, which was discovered during construction work in the 1970s and was the subject of archaeological excavation at that time. Based on artifactual evidence, this structure was believed by Dr. Farmer, the archaeologist who first studied it, to have been built in the 17th or 18th century and to have burned not long after 1764. (Eastman 1995) This is most likely the house in which George Wythe was born. The second building is the ruin of a later brick house which was for many years the main feature of the property. It may have been begun as early as 1771, when George Wythe placed an order for building supplies with London merchant J.H. Norton. (Wythe 1771) It still stood until 1911, when it was destroyed by fire. A single photograph of it exists, from 1905. The ruins of this house are still very obvious today, and stand roughly 4 feet high.

No other structures associated with the plantation are known. The route of the road which originally connected the plantation house to the former Back River Road is known from several maps and surveys (e.g. Quinn 1971) and has been confirmed by archaeological work, and beginning in 1809 we have a series of surveys and maps which give us some idea of the plantation boundary lines, but this represents all of our definitive knowledge about the landscape.

Beyond this, we must turn to the handful of written descriptions of the property which have survived to guide our analysis of the former landscape. The most complete of these descriptions is from 1795, when George Wythe placed a newspaper advertisement to sell the property. In it, he described "a large negro quarter, a kitchen, stable, and store-house in good repair, and a grannary 60 by 28 feet...at which vessels of 60 tons may load." (Wythe 1795) Wythe also described the land itself, as including "920 acres of land, of which 477 are cleared, divided and ditched round in 50 acre lots, 233 in wood, and 210 in fine grazing marsh" and "an orchard of about 6 acres." (ibid.) Another description comes from an indenture written in 1808 by then-owner Houlder Hudgins, in which he described the property as including "seven hundred acres of land with all the houses, gardens, orchards, waters, woods, and commodities" and "twenty Negro labors." (Hudgins 1808) A few other descriptions similar to this can be found in various wills and deeds. Finally, a very minimal description comes from a letter written in 1915 by Sue Segar, who had grown up at Chesterville and been there when the American Civil War broke out. She principally describes the brick house already mentioned and the events of the war, but also mentions the presence of a smokehouse very near the main house. (Segar 1915)

Methodology

The basic premise on which the methodological approach used to understand the

landscape of Chesterville rests is the idea that previous landscape patterns will often remain visible in later years, provided that the area has not been heavily altered. A vast quantity of data about the modern Langley base has been collected, and it was from this that I drew my two most important data sources: LIDAR data at roughly 6" resolution, and orthorectified aerial photography, used to help interpret LIDAR results. Other researchers (e.g. Harmon et al. 2006) have shown that detailed contour information such as that provided by LIDAR can actually reveal features of the landscape which are no longer visible to the eye, both because broad landscape-scale features can be difficult or impossible to see from ground level and because the impression which remains from, say, a disused road, former foundation, or filled-in ditch is often so slight. However, such features often do exist, and with sufficiently accurate elevation data they can be identified.

However, before any actual data processing or analysis could be attempted, the study area had to be properly defined. Of the limited descriptions we have of the property, that given in Wythe's 1795 advertisement is by far the most helpful in terms of guiding our reconstruction of the landscape. He specifies the number of acres being put to various uses at the time, and further states that the agricultural land is divided by ditches into 50 acre parcels. This is, therefore, the historic time period for this landscape which we can attempt to reconstruct with greatest confidence. It is also the era most likely to be of interest to people, because of the notoriety of George Wythe. However, there was a problem: Wythe states that the plantation was 920 acres in size, and the known boundary lines for the plantation in later years are much smaller than this, approximately 750 acres. In order to put Wythe's description to the fullest use, this 920 acre boundary had to be discovered.

This boundary determination was based on documentary research, including various land surveys and property tax records, and is shown in Figure 1. To begin with, we have the land which we know from an 1809 survey to have been part of Chesterville at that time, which was surveyed as 750 acres but which I calculate to have been roughly 725. This property was bounded on the north and west by a river and to the southwest and south by other properties of known boundaries and ownership which are not shown on the map because they are not candidates for inclusion in George Wyth's 920 acres.

Properties to the east changed hands much more frequently and are less well understood, and it is in this direction that the additional land almost certainly lay. In this direction, the only property the boundaries of which are relatively well documented and understood was the Sym's Free School. This was property which was established for the support of a school in approximately 1642 in the will of Benjamin Syms, and it has the distinction of being the earliest known free school in English-speaking North America (Campbell 1940). According to the Syms will, the school was on 200 acres of land (Armstrong), but later surveys (and my calculations) make it approximately 285. It is worth noting at this point that it is not unusual for early surveys to be incorrect by such a margin. Surveying equipment of the day was very rudimentary and boundary markers were often inconstant features of the landscape such as trees, waterways, or even beaver dams. The Sym's School would have been a particularly difficult tract to survey accurately, because quite a large fraction of it was swamp.

The next property whose history can help us define the historic Chesterville boundary is the "Lease Land," a parcel of about 50 acres just to the west of the school land. In a description of that property from a 1670 lease agreement, it is described as "beginning upon the old

Poquoson River Side [the north boundary of properties shown in Figure 1] extending its breadth upon the Schoole land on the one side and upon a pattent of two hundred Acres of Land on the other side [a patent known to have been later incorporated into Chesterville] and soe coninueing the breadth of fifty Acres of Land a full myle into the woods." (York County Record Book No. 5, 1670) No accurate survey exists of this property, (the location I give is based on an unpublished and undated map from the 1970s by Farmer) but this description gives us a valuable piece of information: that it bordered Chesterville on one side and the school on the other. This indicates that the 120 acre parcel of land at the northern extreme of Figure 1, the history of which is very little known, must have been part of Chesterville during this period. This is the only way that a 50 acre parcel could have been between the two properties.

Our next piece of guidance comes from the history of a parcel later called the "Moore Tract." This property of roughly 50 acres was originally part of a larger plantation owned by the Moore family. It is described in 1808 as being bounded "on the East by the Land of Wm. Moore, and on the North and West by the Land of Houlder Hudgins [then owner of Chesterville]." (Elizabeth City County Deed Book 33, 1808) This is significant for the light it throws on the small triangular parcel just to the north, between Chesterville and the Sym's Free School on Figure 1. Based on the description of the Moore Tract boundary, this parcel of 17 acres must have been part of Chesterville as well.

So far, that puts Chesterville at 862 acres, easily close enough to 920 that an 18th century survey could have been off by that amount. However, it is also possible that additional land was included. The most likely candidate would be the 50 acres of "Lease Land" already mentioned. Ownership of this property is somewhat obscure during the period in question, but we can be

fairly confident that, if he did not own it, Wythe was leasing the land, as he leased all but one acre of the school land. (Starkey 1936) Thus, it is possible that this should be included in the 920 as well, though we cannot be certain. My reconstructions have been undertaken under the assumption that this land should not be included.

Thus, with more confident knowledge of the property boundaries, it was possible to proceed with the analysis. LIDAR data was acquired for the study area in an ASCII format. In ArcGIS, the ASCII 3D to Feature Class tool was used to convert these files into a single large point feature class. These points were used to generate a TIN, and were also used to generate several different DEMs using different interpolation methods. Ultimately, it was determined that the TIN offered the most helpful representation of the landscape, and it was the one which was most often used during the analysis. Contour lines were also generated from this file in order to overlay elevation data with orthorectified aerial photography.

Results

To begin the landscape reconstruction, the attempt was made to divide the property into the three different use areas which Wythe described in his advertisement: agricultural land, wooded land, and marsh. The last of these is the simplest to reconstruct, because quite a large part of the Langley base is still very marshy and, based on all known documentation, the boundaries of this area have probably not changed substantially. Thus, the boundary digitized for the marsh largely represents the current boundary, with relatively minor changes where alterations are known to have occurred. The remaining highlands then had to be divided into wooded and agricultural zones. In order to achieve this, it was necessary to try to locate the ditches which Wythe described dividing his fields.

As it turns out, the elevation information for the former plantation area reveals quite a sizable number of ditches. Some of these are still in use, while others are very shallow and clearly disused. Obviously, not all ditches observed date from the plantation period, and in some cases this is very obvious because the ditch aligns with a modern building or road constructed since NASA ownership of the property. However, we can demonstrate from aerial photographs and land surveys dating from the late 1940s that many of the ditches still observed were already present at that time, before any NASA construction. This means that they were certainly present when the land was operated for agricultural purposes, and some may, in fact, be some of the ditches to which George Wythe referred in his advertisement.

Figure 2 is a map showing the arrangement of ditches on the property, excluding ditches known to be associated with modern, NASA-era features and including some "extrapolated" ditches which are not visible on the modern landscape but which are observed in old aerial photos or land surveys. Some ditches which were interrupted by modern construction but which can be seen on both sides of it are also shown as continuous features. Figure 2 also shows two historic roadways dating from the plantation era, both of which are no longer present, and the two positively known plantation buildings already described.

Observing Figure 2, it is very clear that all evidence of ditching on the property occurs to the north of old Back River Road, the historic roadway running roughly east-west through part of the property and turning off to the southeast. This area has not been landscaped or otherwise altered substantially since NASA ownership, and I think it very unlikely that evidence of ditching to the south of the road would have been lost while being preserved to the north of it. As such, we can reasonably infer that it was the area to the south of the road which was wooded

at the time of Wythe's advertisement, and the area to the north which was used for agriculture. This division results in the following arrangement of acreage: roughly 130 acres of marsh, 222 acres of woods, and 448 acres of agricultural land. Recall that, in Wyth's advertisement, he described 210 acres of marsh, 233 of wood, and 477 of agricultural land. This comparison provides additional confidence in the accuracy of the reconstruction, because it is very close to both the wooded and agricultural numbers given by Wythe. The value for the marsh land is much more different, but, as already noted, this would have been the most difficult section to survey with historic methods and, therefore, the most likely to be in error, as well as being potentially subject to natural changes in area due to environmental processes.

Finally, to make the reconstruction as complete as possible, the attempt was made to determine the boundaries of the 50-acre fields which Wythe describes. It should be clear from the ditch arrangement in Figure 2 that there is not an obvious division of the agricultural land into 50 acre parcels and that, based on the ditch arrangement known and extrapolated, several possible arrangements of 50 acre fields would be possible. Figure 3 shows the arrangement which I believe most likely, but I emphasize that it is conjectural and that other equally valid arrangements are possible. Figure 3 also indicates two possible locations for the 6 acre orchard which Wythe described as "near to the dwellings."

Conclusion

Though there are, clearly, limitations to the scope of information which a reconstruction like this one can provide, our understanding of the historic landscape of the Chesterville plantation has been greatly expanded by this project. Prior to this research, no attempt had been made to determine the historic land use of the different parts of the plantation, and even the

plantation boundary was relatively poorly understood. We can now address those two points with confidence, and can even make a reasonable guess regarding field boundaries. Locating and digitizing ditches proved to be a very successful methodology, and the LIDAR data employed was invaluable in this process. Aerial photographs held by NASA were also extremely helpful, and many of these can be viewed by the general public on the NASA Cultural Resources website (http://crgis.ndc.nasa.gov/historic/). Comparatively ephemeral features, such as historic structures no longer visible on the landscape, could not be identified through the LIDAR data, presumably in part because most such structures would have been in the northern part of the study area, near the known historic buildings, and this area has been landscaped fairly heavily since NASA ownership. LIDAR data of an even higher resolution than that used might reveal such features, though there is, of course, no guarantee. Ultimately, it would only be through the application of remote sensing technology or archaeological fieldwork that such features could be reliably discovered.

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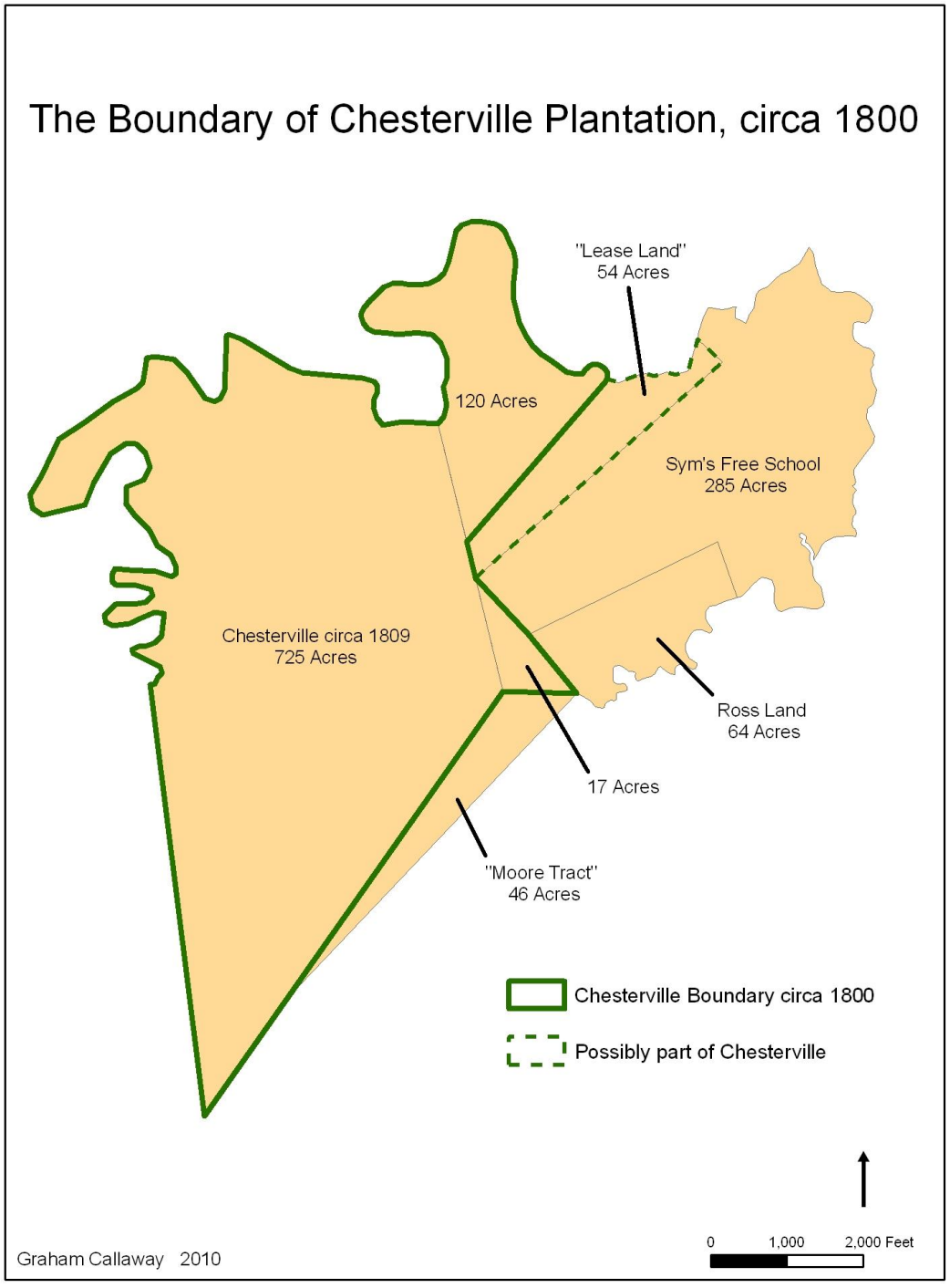
The Boundary of Chesterville Plantation, circa 1800
"Lease Land"
54 Acres
120 Acres
Sym's Free School
285 Acres
Chesterville circa 1809
725 Acres
Ross Land
64 Acres
17 Acres
"Moore Tract"
46 Acres
Chesterville Boundary circa 1800
Possibly part of Chesterville
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0
1,000
2,000 Feet

Figure 1

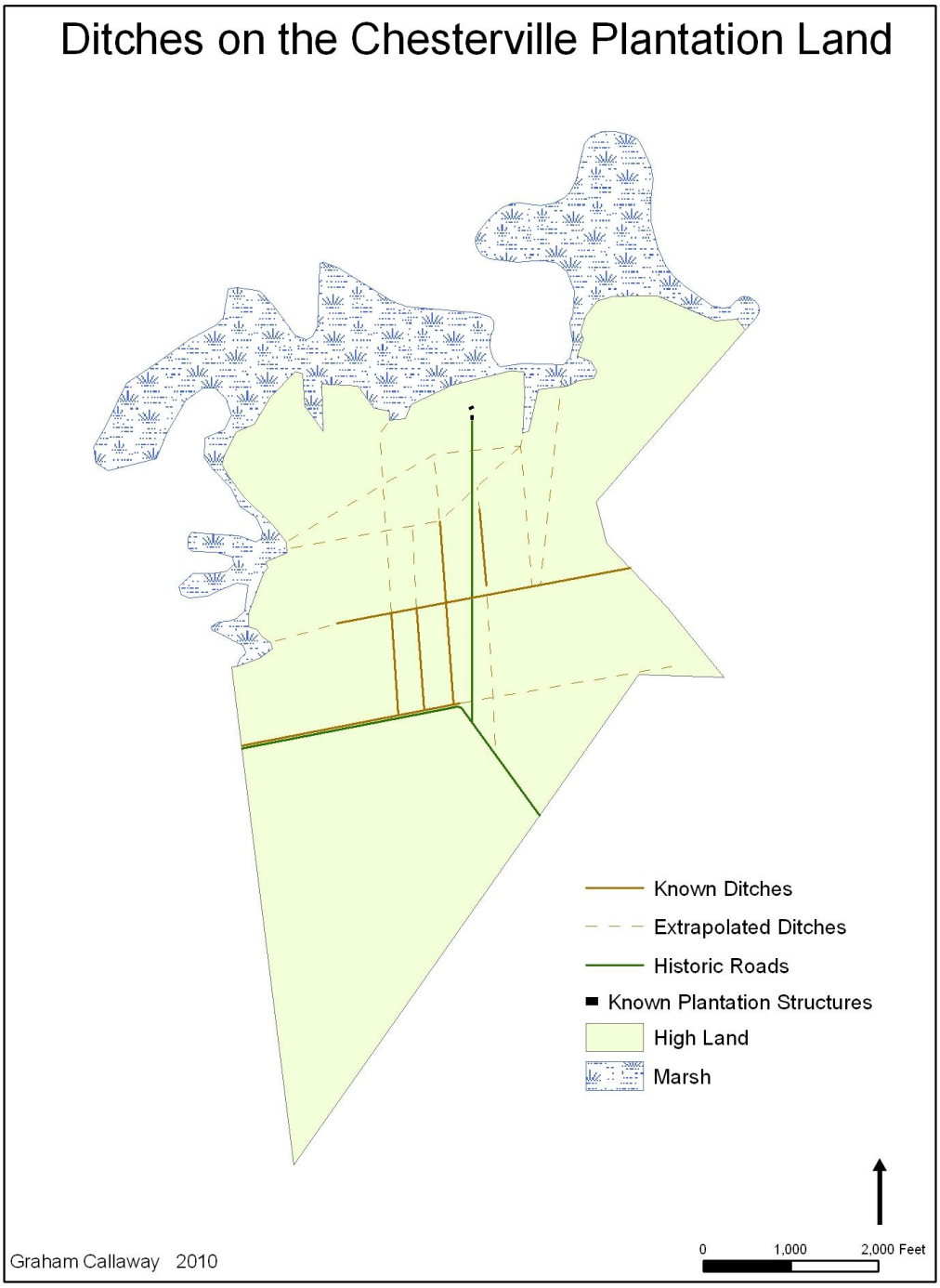
Ditches on the Chesterville Plantation Land
Known Ditches
Extrapolated Ditches
Historic Roads
Known Plantation Structures
High Land
Marsh
Graham Callaway 2010
0
1,000
2,000 Feet

Figure 2

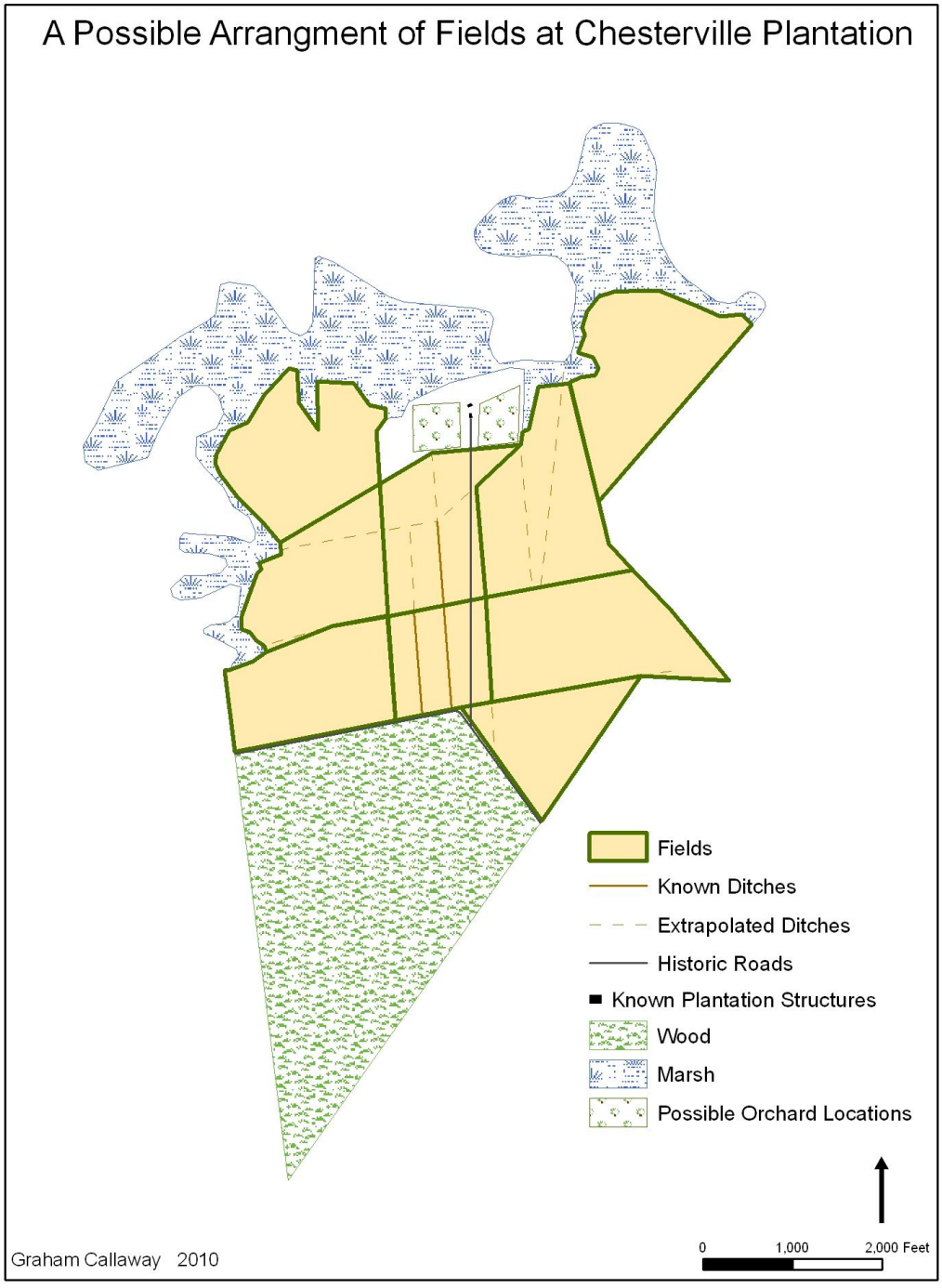
A Possible Arrangment of Fields at Chesterville Plantation
Fields
Known Ditches
Extrapolated Ditches
Historic Roads
Known Plantation Structures
Wood
Marsh
Possible Orchard Locations
0
1,000
2,000 Feet
Graham Callaway 2010

Figure 3